

US 2004/0000000 A1

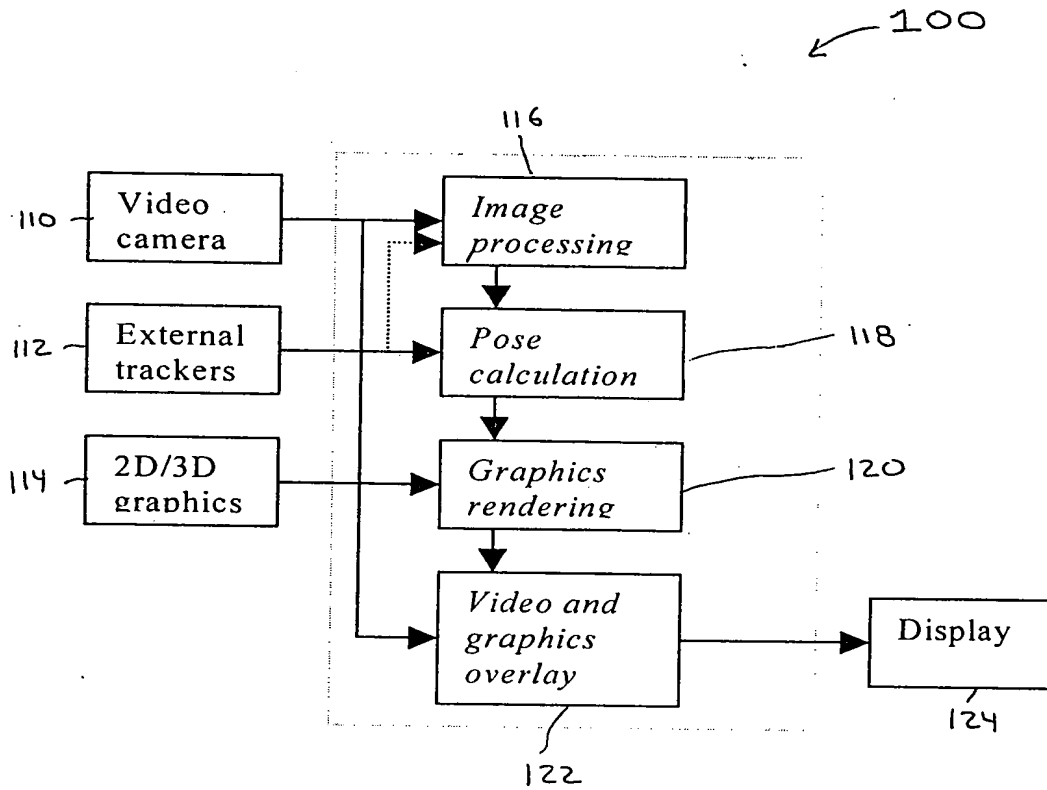


FIG. 1

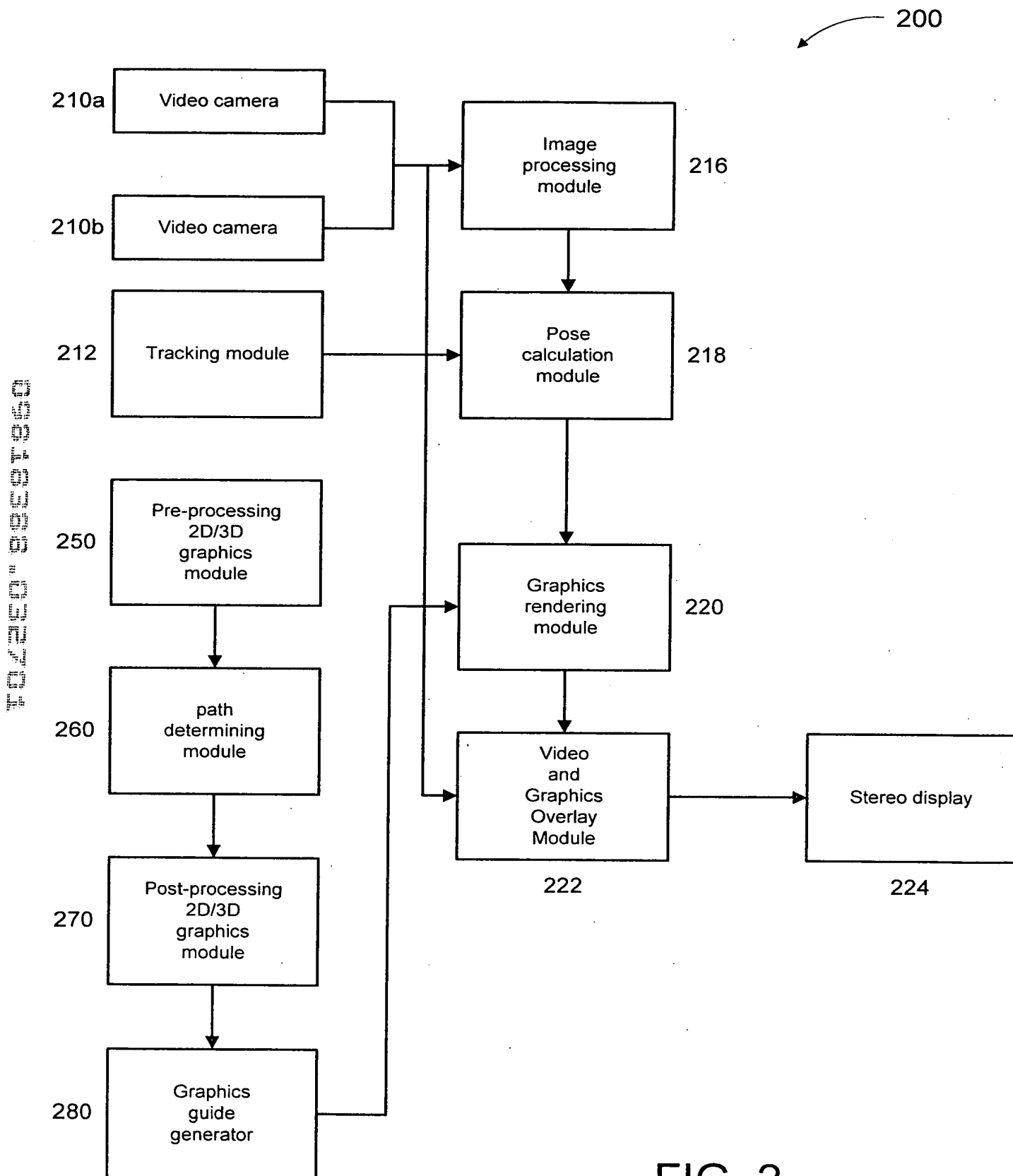


FIG. 2

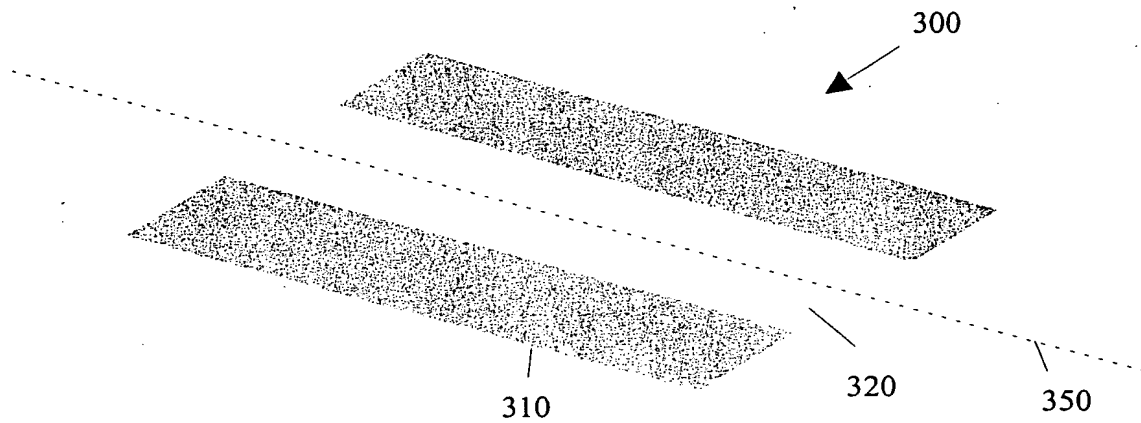


FIG. 3

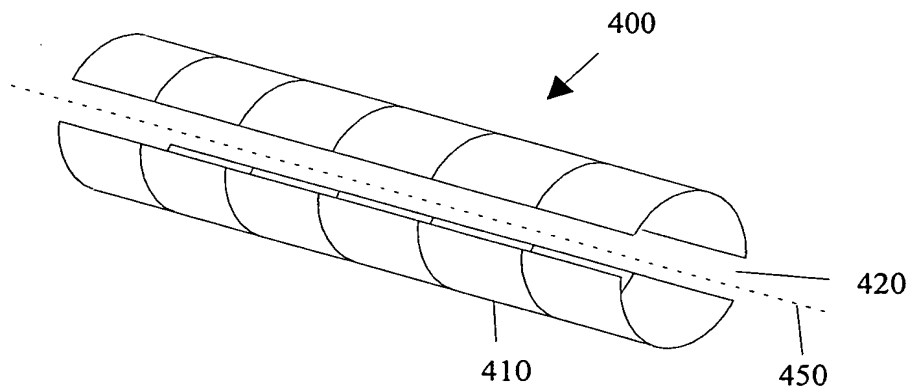


FIG. 4

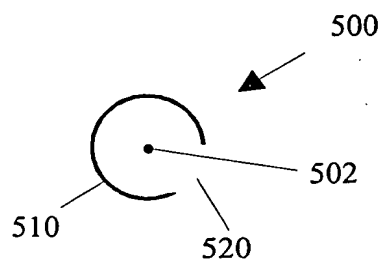


FIG. 5

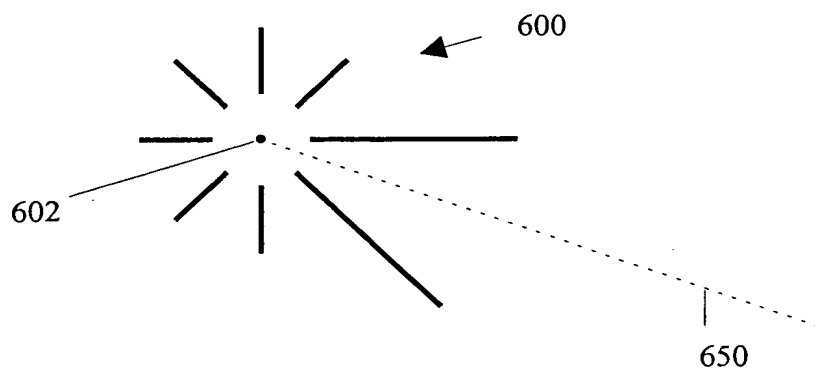
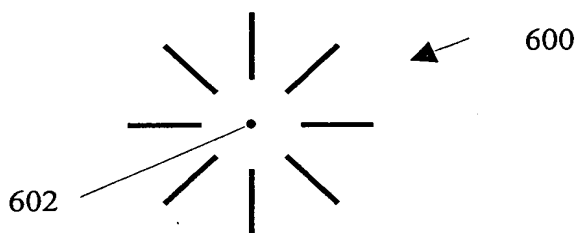


FIG. 6

2025 RELEASE UNDER E.O. 14176

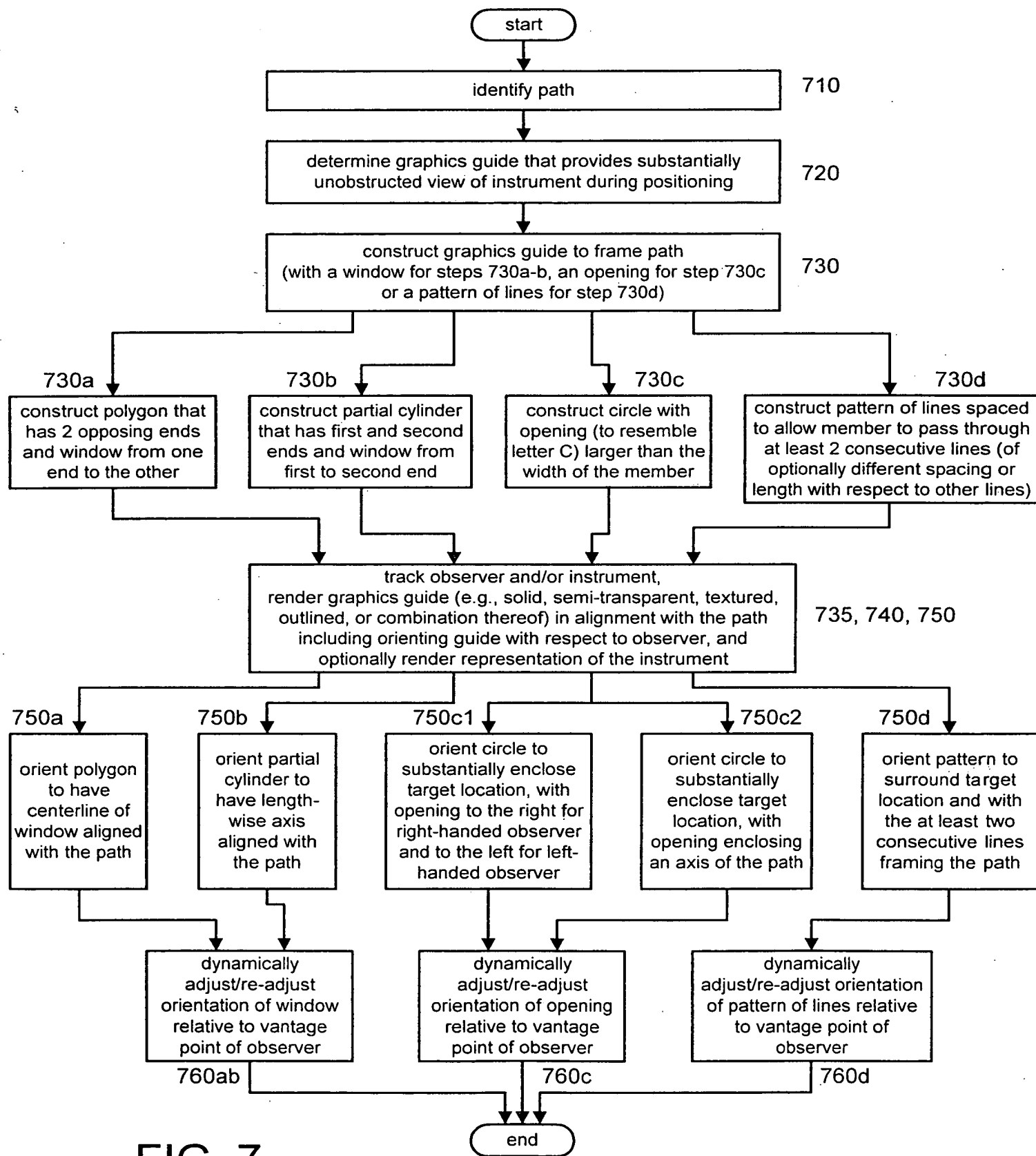


FIG. 7

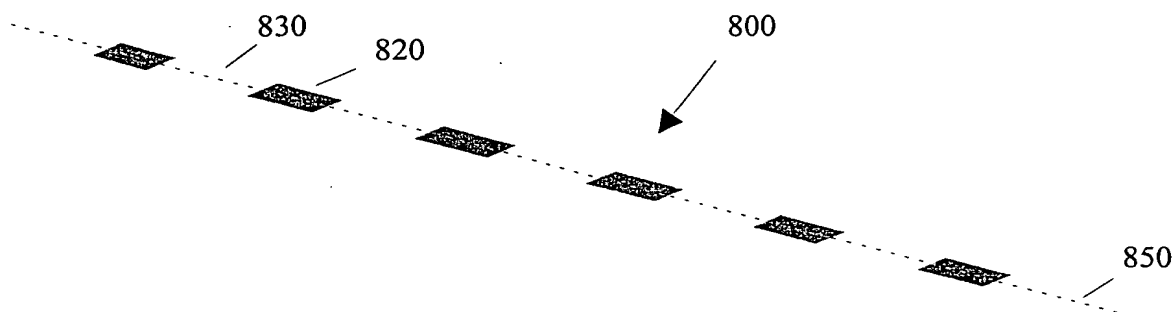


FIG. 8

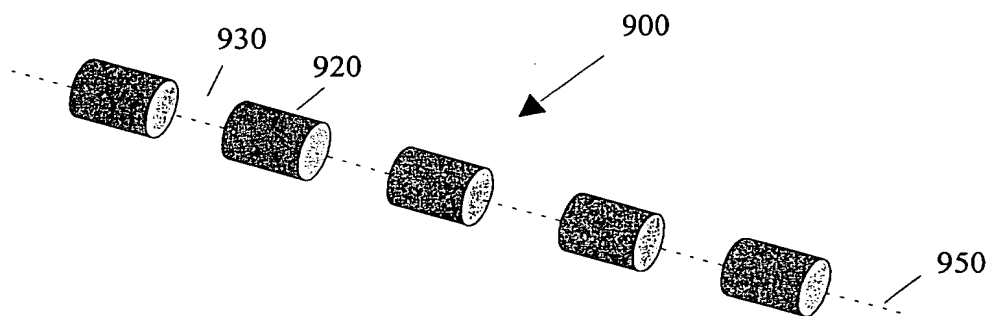


FIG. 9

TOP SECRET

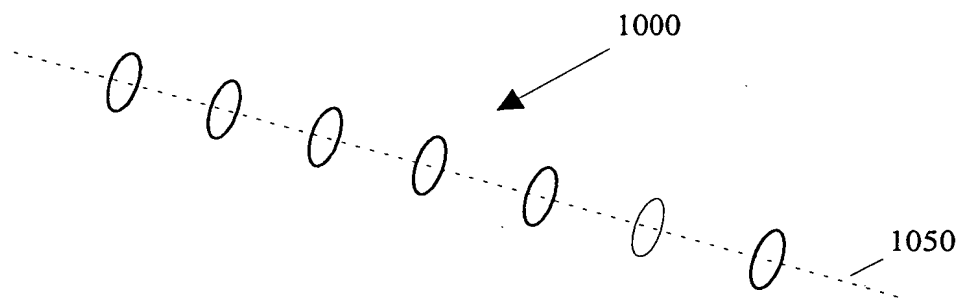


FIG. 10

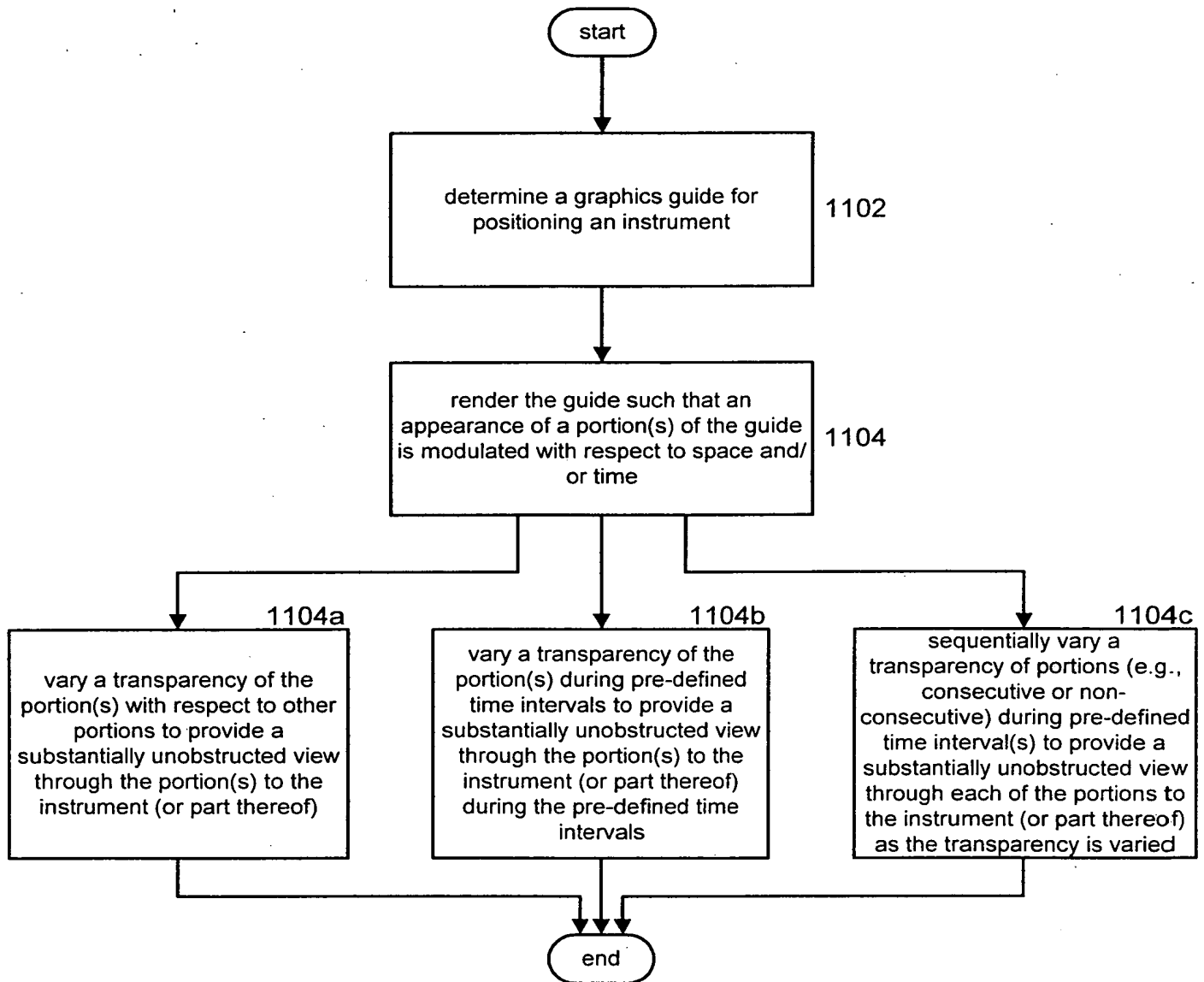




FIG. 11B

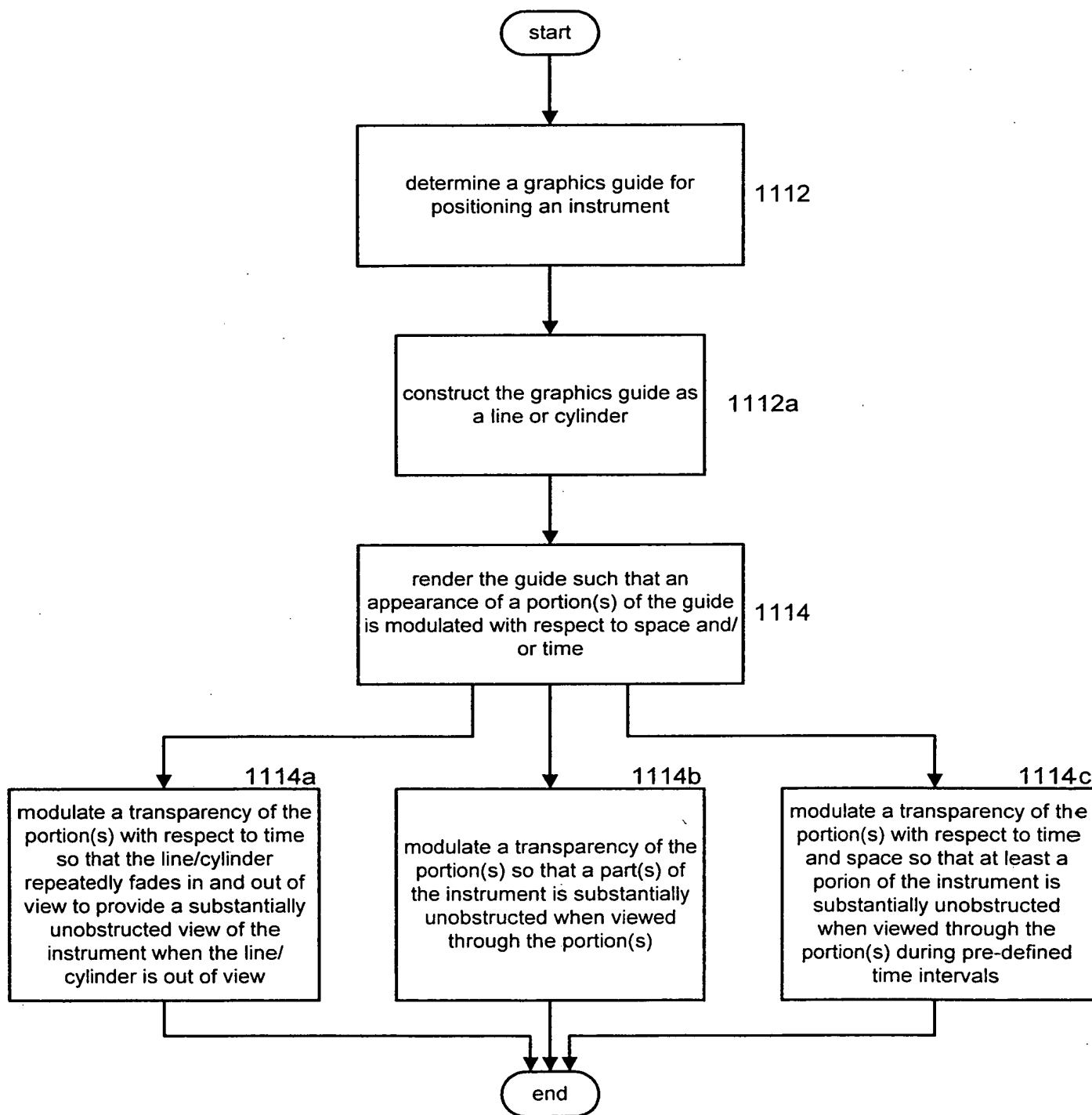


FIG. 11B

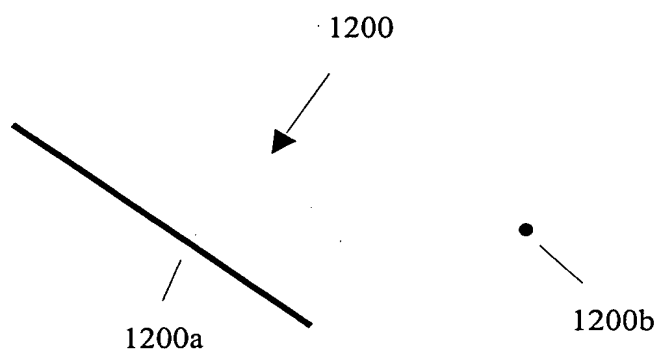


FIG. 12

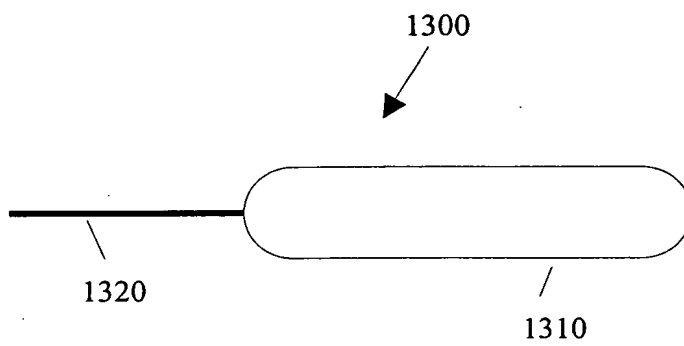


FIG. 13

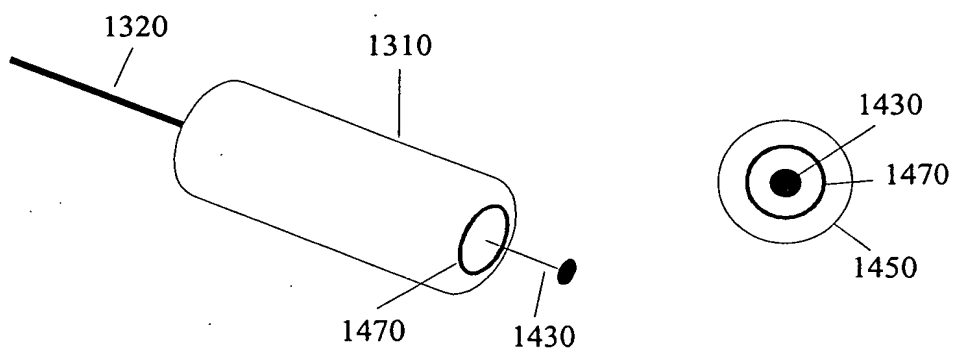
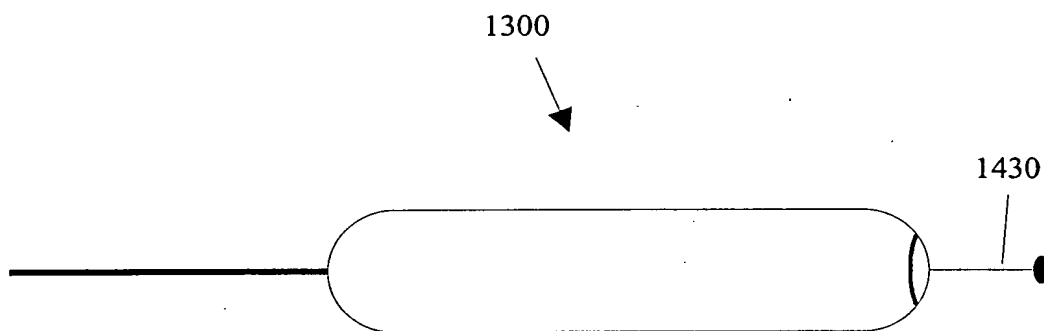


FIG. 14

FIG. 13

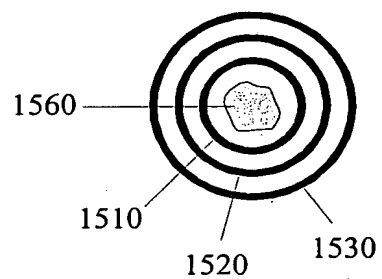
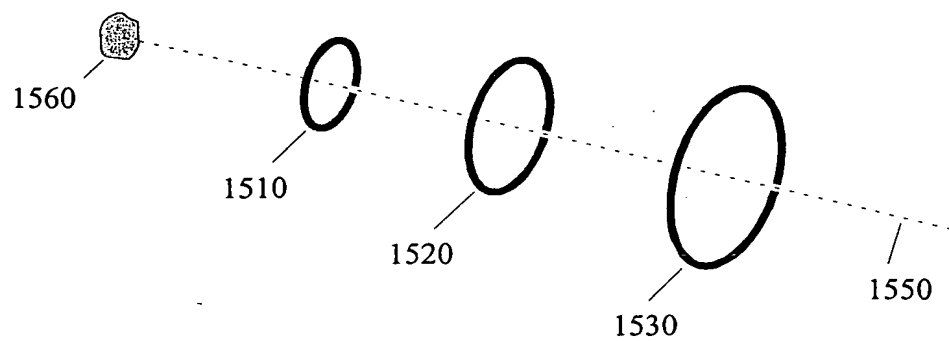


FIG. 15

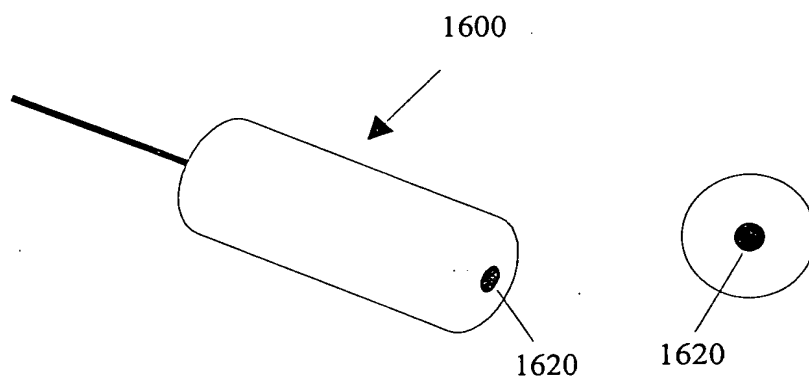


FIG. 16

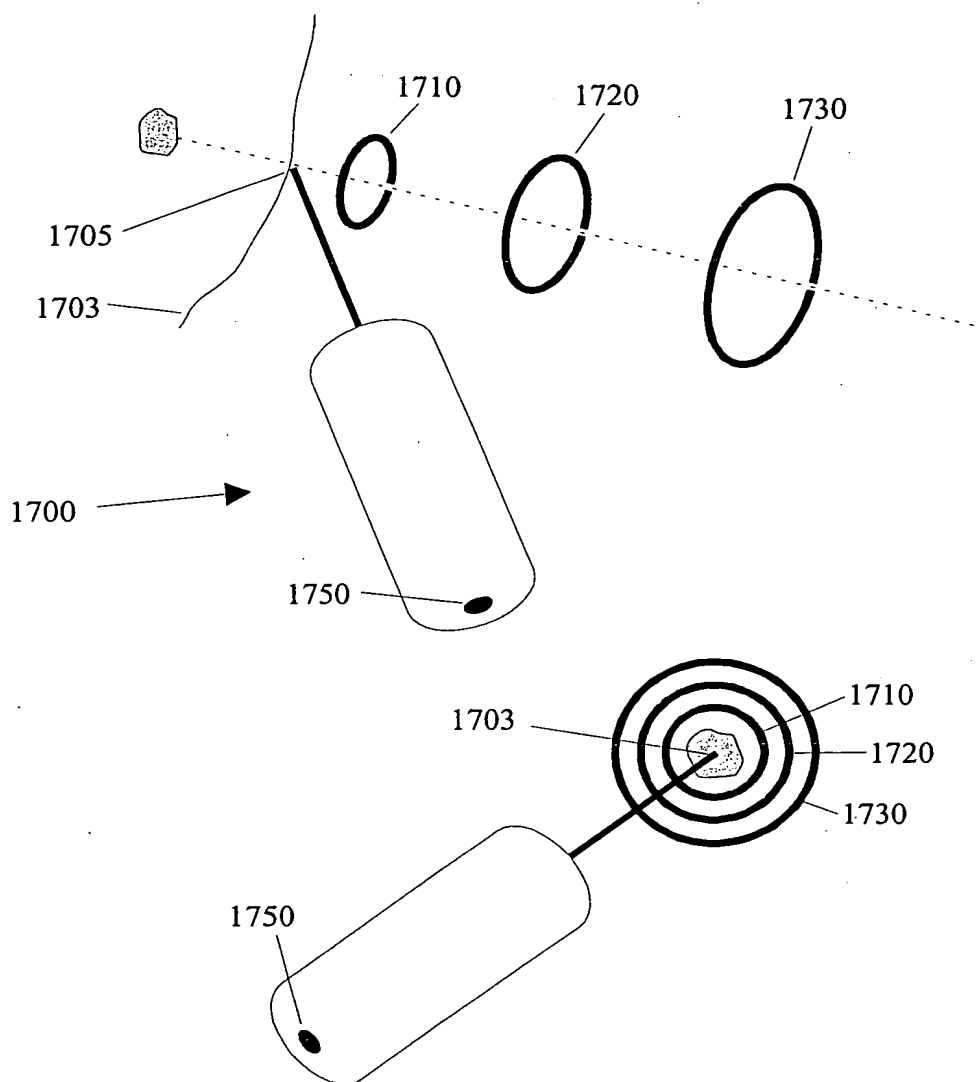


FIG. 17A

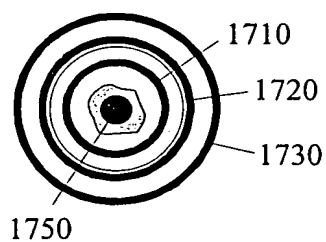


FIG. 17B

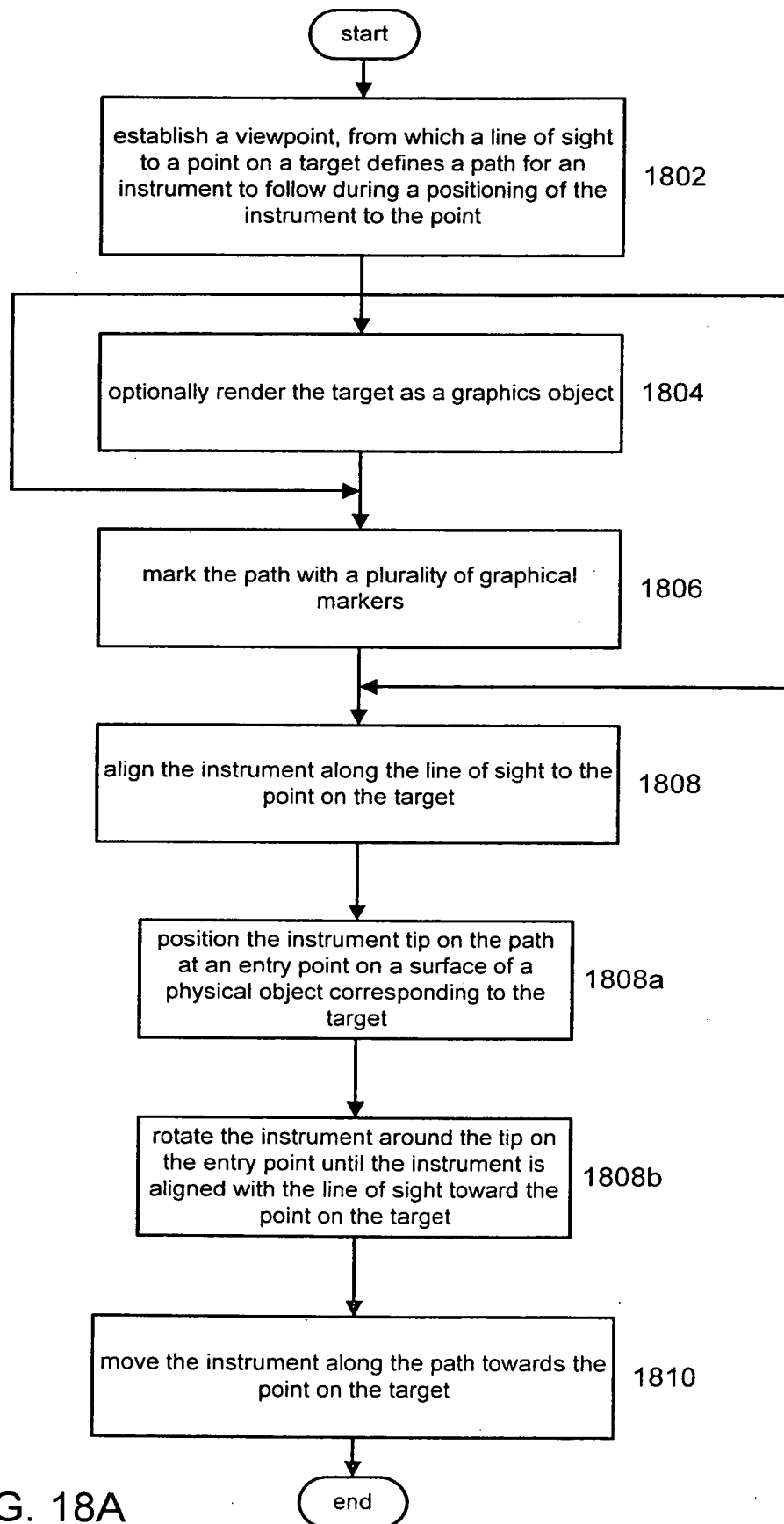
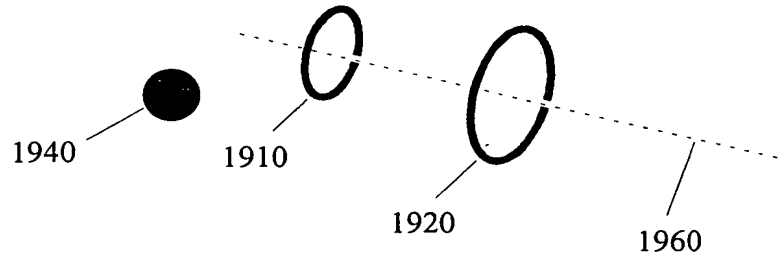


FIG. 18A



not aligned



aligned

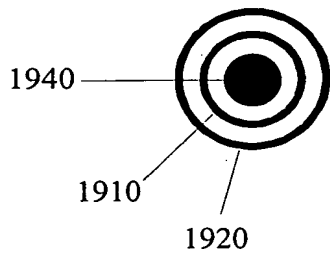
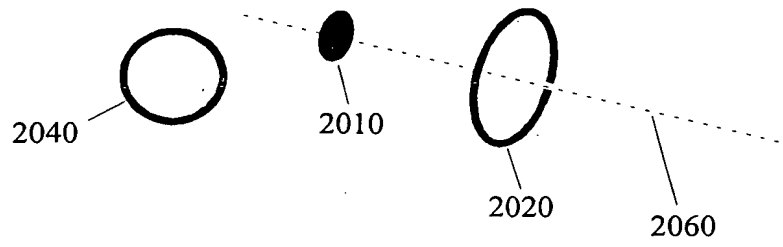


FIG. 19



not aligned



aligned

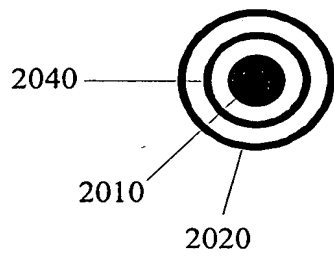
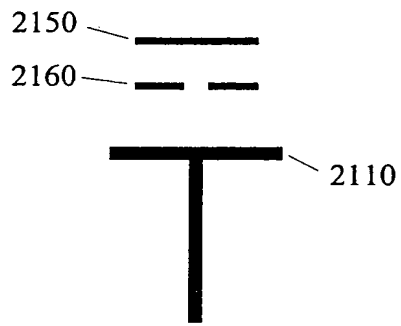
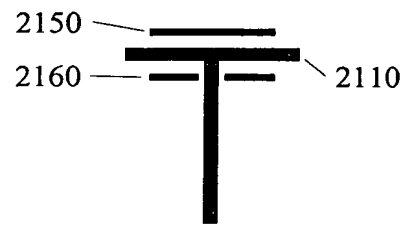


FIG. 20

FIG. 20



target depth not yet reached



taget depth reached

FIG. 21

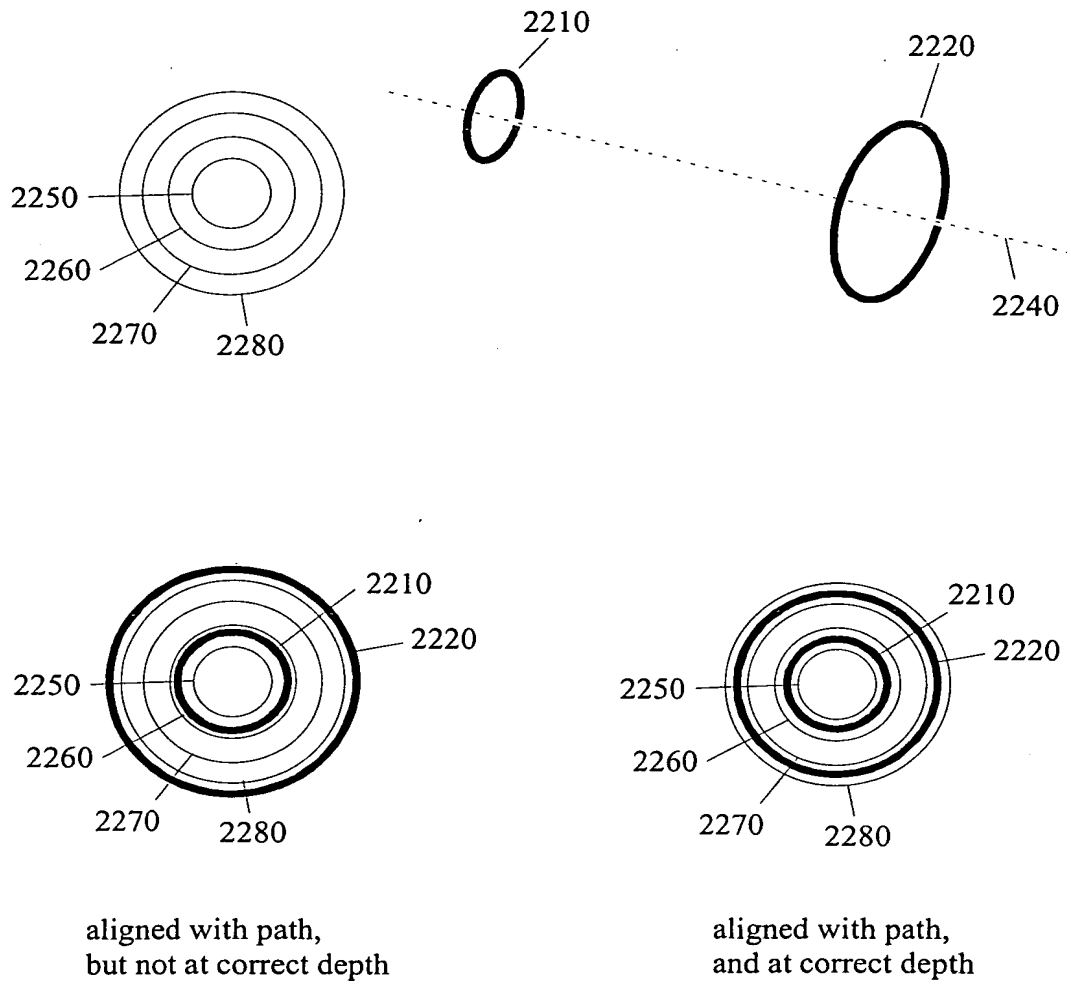


FIG. 22

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graph TD
    Start([start]) --> 2302[define a point on an actual target and an actual path to reach the point on the actual target]
    2302 --> 2304[track a pose of an instrument with respect to a pose of the actual target]
    2304 --> 2306[choose an orientation of the graphical representation around the virtual line of sight according to a pose of a user with respect to the actual target]
    2306 --> 2306a[determine based on a selection the orientation such that East, West, North, and South correspond to right, left, forward, and backward, respectively, for the pose of the user where user faces the actual target]
    2306a --> 2306b[dynamically adjust the orientation according to a change of the pose of the user]
    2306b --> 2306c[dynamically adjust the selection with respect to the pose of the user]
    2306c --> 2308[render a graphical representation of the actual instrument and the actual target to obtain a virtual instrument and a virtual target point, respectively, the graphical representation being rendered with respect to a virtual viewpoint from which a virtual line of sight to the virtual target point coincides with a virtual path or the actual instrument to follow during a positioning of the actual instrument to the point on the actual target, the virtual path corresponding to the real path]
    2308 --> 2310[render graphical information about a distance between the actual instrument and the point on the actual target optionally according to a virtual camera with a wide angle lens]
    2310 --> 2312[overlay the graphical information about the distance onto the graphical representation]
    2312 --> 2314[combine the graphical representation from the virtual viewpoint with another graphical representation from another virtual viewpoint looking at the virtual path from the side]
    2314 --> 2316[combine the graphical representation from the virtual viewpoint with an augmented reality view]
    2316 --> 2318[align the virtual instrument along the virtual line of sight of the virtual target point to align the actual instrument along the actual path]
    2318 --> 2320[move the actual instrument along the actual path towards the point on the actual target]
    2320 --> End([end])
  
```

FIG. 23

FIG. 23

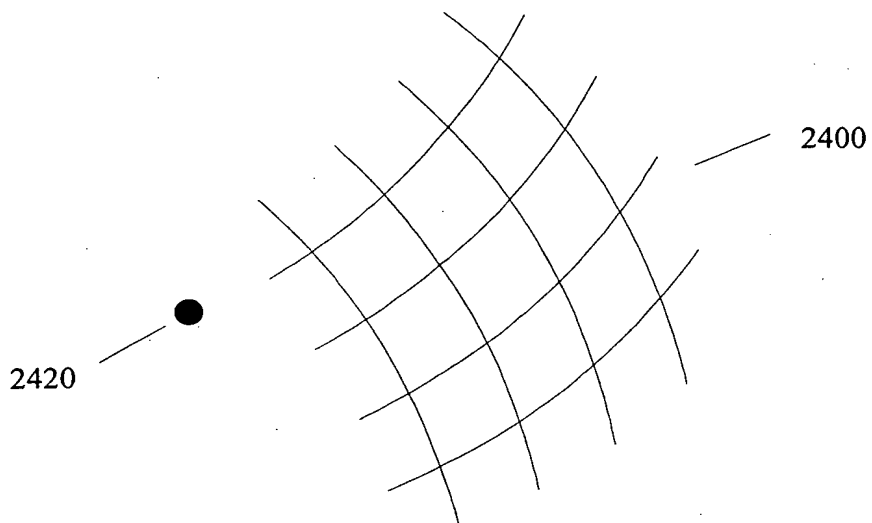


FIG. 24

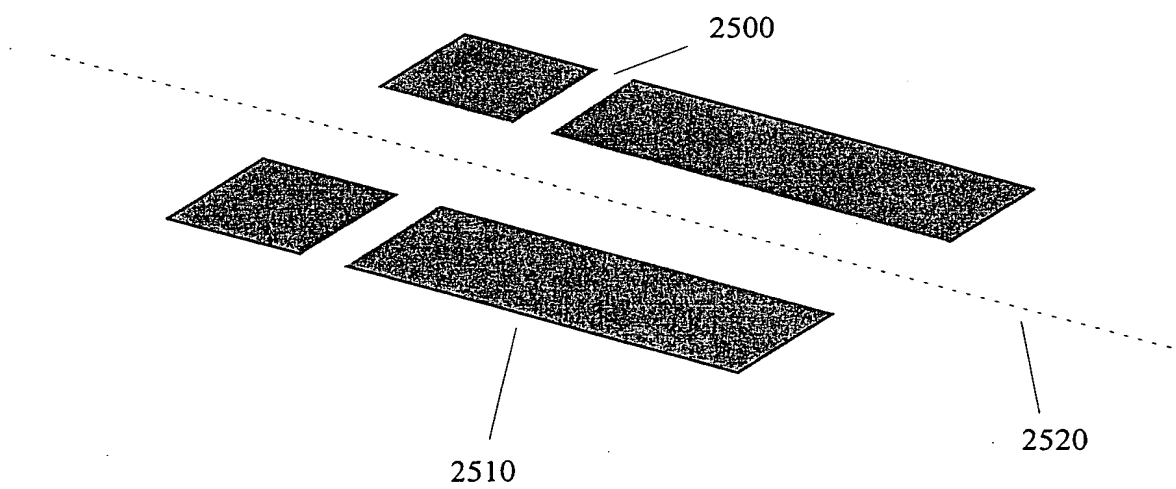


FIG. 25

FIG. 26

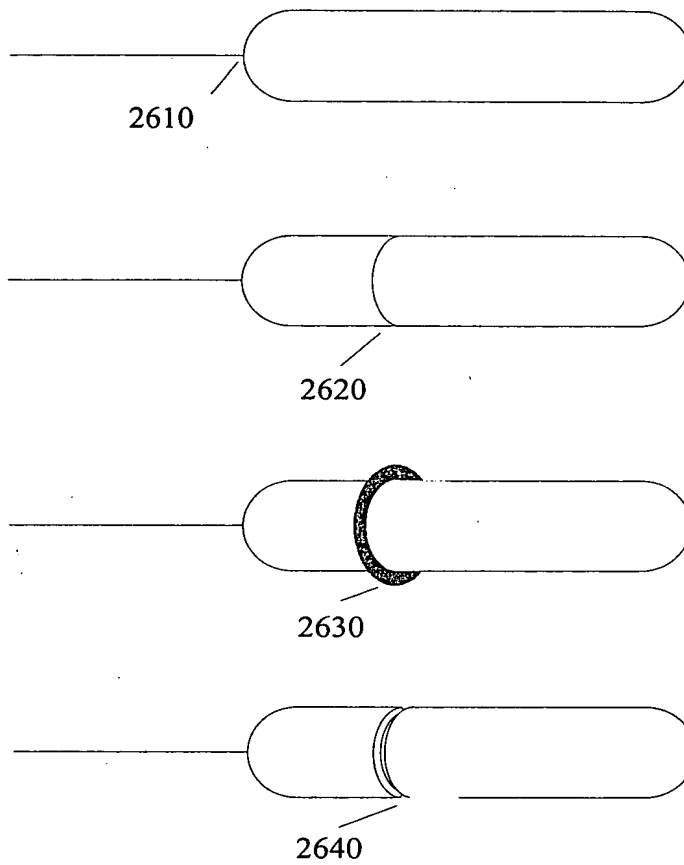


FIG. 26

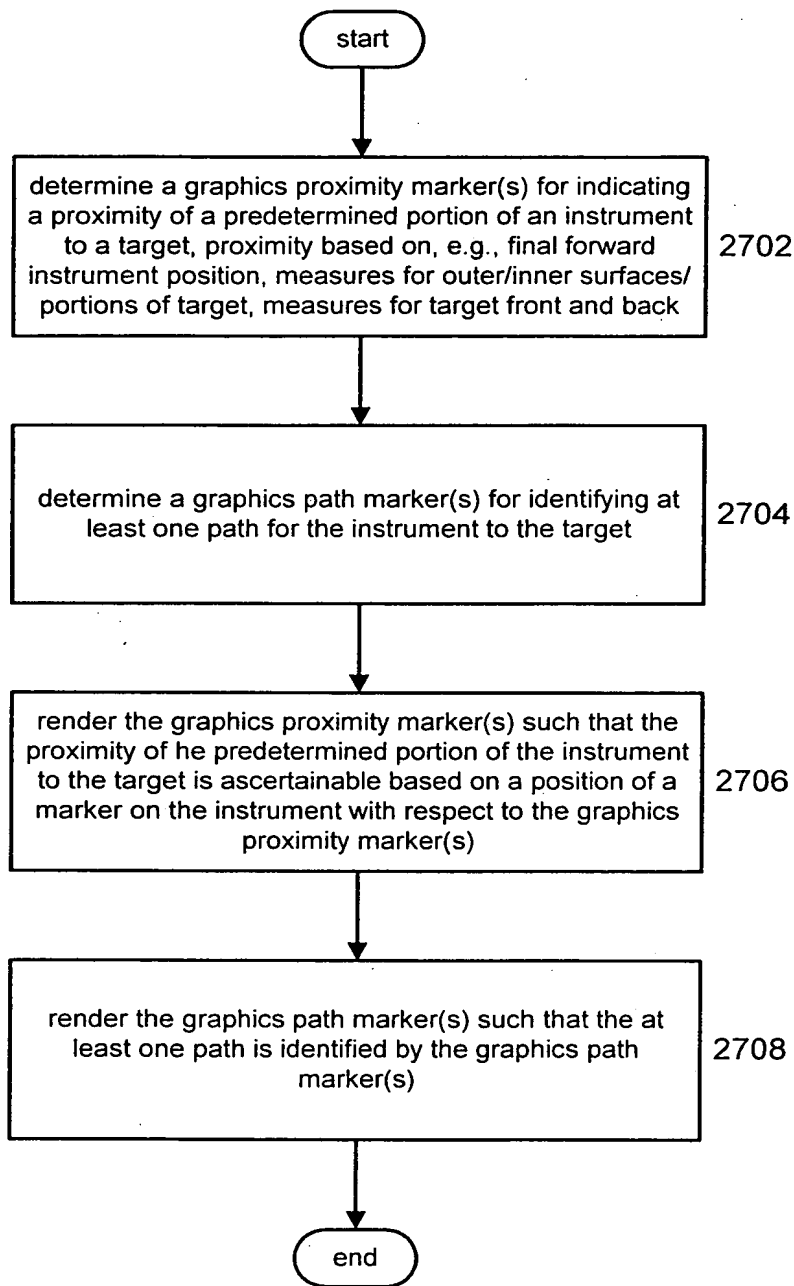


FIG. 27